Fig. 1

IP packet transmission apparatus A

multiplexing
/fragmentation means

a1

router

a2

private network

a3

IP
telephone

a4

IP
network

1

IP packet transmission apparatus B

b1

multiplexing
/fragmentation means

router

b2

private network

b3

IP
telephone

b4

Fig. 2

multiplexing/fragmentation means a1

multiplexing/fragmentation reference table

ID	terminal IP address	self/destination apparatus IP address
1	132.182.1.101	132.182.1.1
2	132.182.1.102	132.182.1.1
3	132.182.2.101	132.182.2.1

a11

multiplexing/fragmentation processing unit   a12

timer   a14

sender buffer   a13

router   a2

IP network   1

Fig. 3

IP header (20 bytes)	UDP header (8bytes)	RTP header (12 bytes)	payload (approximately 20 bytes)

IP packet

IP payload

Fig. 4

multiplexed packet

| IP header including IP address (132.182.1.1) of destination apparatus | ID (example:1) | IP payload (portion removing IP header from IP packet) | ID (example:2) | IP payload (portion removing IP header from IP packet) | . . . |

Fig. 5

```
                    ┌─────────────────┐
                    │  multiplexing   │
                    └─────────────────┘
                            │
                            ▼ ◄──────────────────────────────┐
                        ╱───────────╲                        │
           step1      ╱  condition #1 ╲      Y               │
                      ╲  is satisfied ╱────────────┐         │
                        ╲───────────╱              │         │
                            │ N                    ▼  step10 │
                            ▼                ┌─────────────┐ │
           step2    ┌───────────────┐        │ a multiplexed│ │
                    │ IP packet is  │        │ packet       │ │
                    │  received     │        │ prepared in  │ │
                    └───────────────┘        │ the sender   │ │
                            │                │ buffer is    │ │
                            ▼                │ outputted    │ │
                    ┌───────────────┐        │ to the router│ │
                    │ referring to  │        └─────────────┘ │
                    │ the reference │               │        │
                    │ table, the    │               ▼ step11 │
           step3    │ multiplexing/ │        ┌─────────────┐ │
                    │ fragmentation │        │ timer is    │ │
                    │ processing    │        │ initialized │ │
                    │ unit tries to │        └─────────────┘ │
                    │ acquire ID    │               │        │
                    │ and an IP     │               └────────┼──►
                    │ address of    │                        │
                    │ the destination│                       │
                    │ apparatus     │                        │
                    └───────────────┘                        │
                            │                                │
                            ▼                                │
                        ╱───────────╲      N                 │
           step4      ╱ acquisition  ╲──────────┐            │
                      ╲             ╱           │            │
                        ╲───────────╱           │            │
                            │ Y                 ▼   step5     │
                            ▼             ┌─────────────┐     │
                    ┌───────────────┐     │ packet is   │     │
                    │ referring to  │     │ aborted     │     │
                    │ the sender    │     └─────────────┘     │
                    │ buffer, a     │            │            │
           step6    │ record which  │            └────────────┼──►
                    │ contains the  │                         │
                    │ IP address of │                         │
                    │ the destination│                        │
                    │ apparatus     │                         │
                    │ is searched   │                         │
                    └───────────────┘                         │
                            │                                 │
                            ▼                                 │
                        ╱───────────╲      N                  │
           step7      ╱ record exists ╲──────────┐            │
                      ╲             ╱            │            │
                        ╲───────────╱            ▼   step9    │
                            │ Y          ┌─────────────┐      │
                            │            │ a record    │      │
                            │            │ which       │      │
                            │            │ contains an │      │
                            │            │ IP header   │      │
                            │            │ including   │      │
                            │            │ the IP      │      │
                            │            │ address of  │      │
                            │            │ the destination│   │
                            │            │ apparatus   │      │
                            │            │ is newly    │      │
                            │            │ prepared    │      │
                            │            └─────────────┘      │
                            ▼ ◄──────────────────┘            │
                    ┌───────────────┐                         │
                    │ the ID is     │                         │
                    │ added to the  │                         │
           step8    │ end of the    │                         │
                    │ record and the│                         │
                    │ IP payload is │                         │
                    │ added to the  │                         │
                    │ end of this   │                         │
                    └───────────────┘                         │
                            │                                 │
                            └─────────────────────────────────┘
```
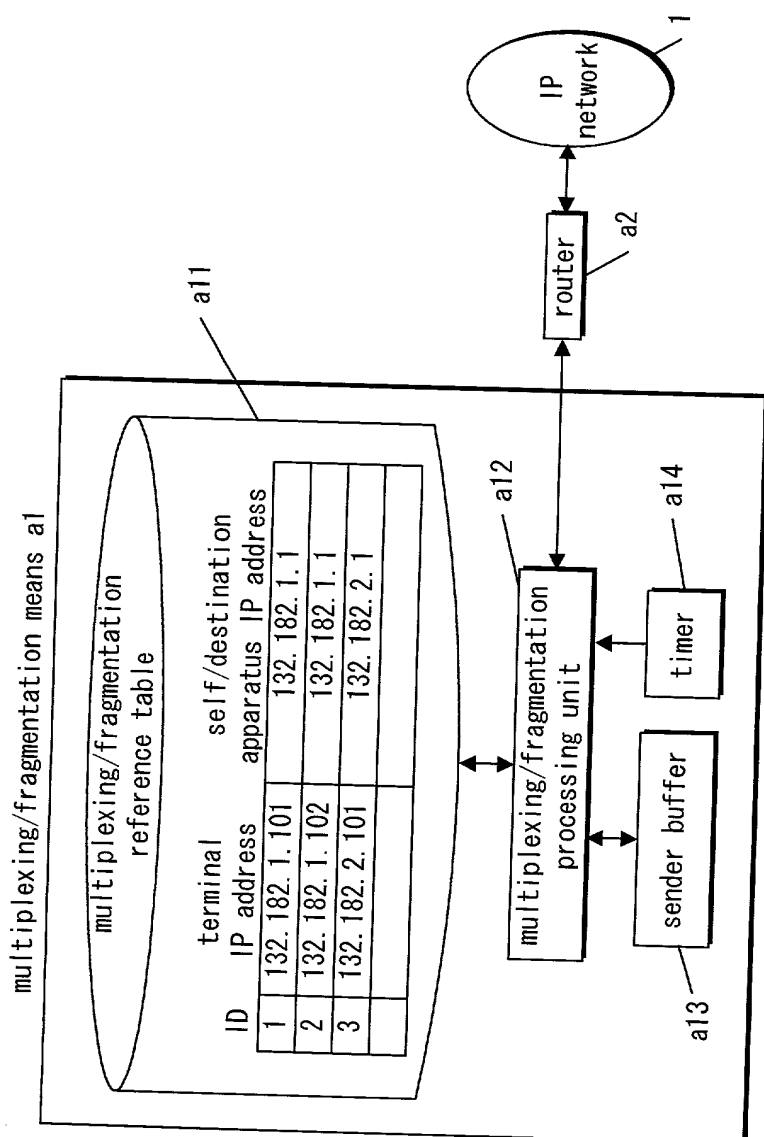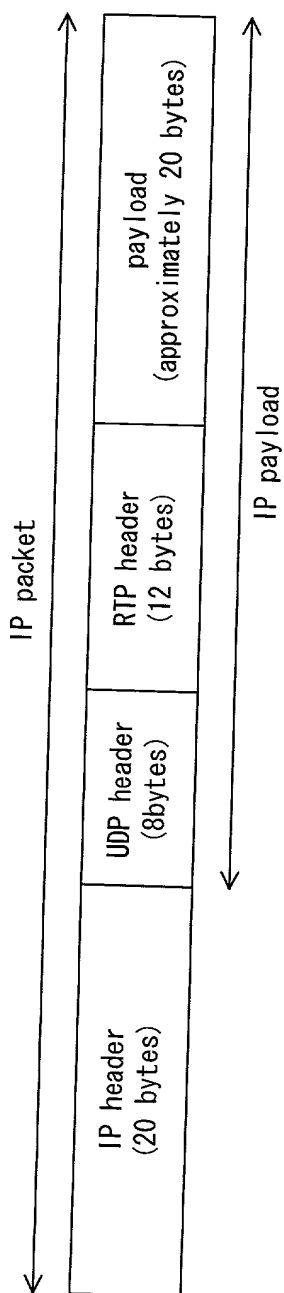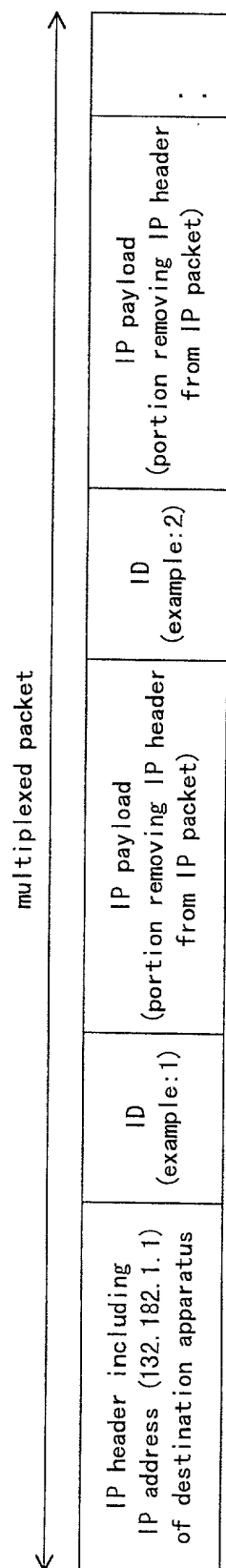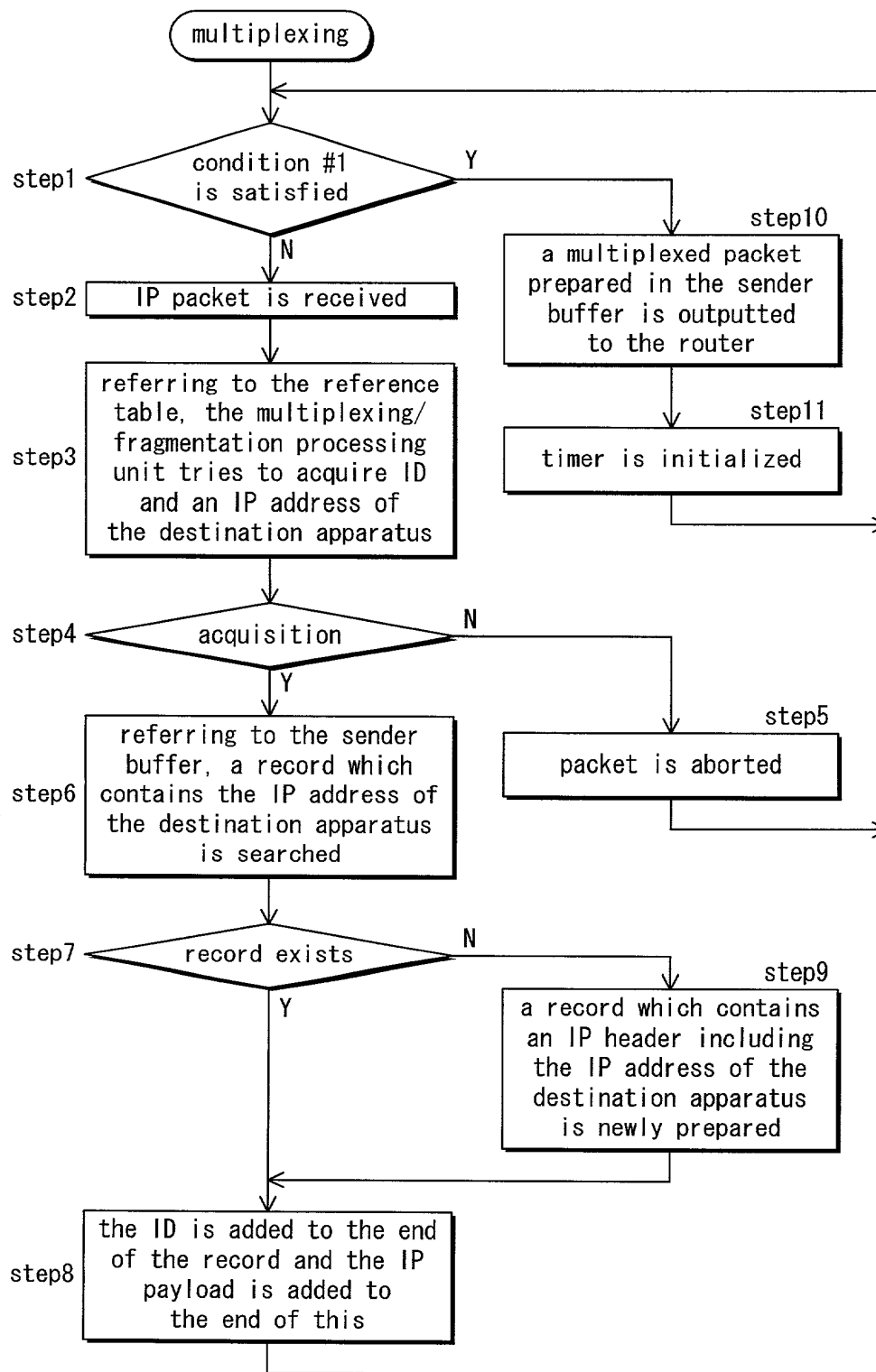
#1: the timer is interrupted or the length of
    a multiplexed packet exceeds the predetermined value

Fig. 6

```
                    ( fragmentation )
                           │
                           ▼
         ┌─────────────────────────────────┐
         │    an IP header is deleted       │    step21
         │   from a multiplexed packet      │
         └─────────────────────────────────┘
                           │
          ┌────────────────┤
          │                ▼
          │              step22
          │         ╱─────────────╲
          │        ╱  an object of  ╲        N        ┌──────────┐
          │        ╲ fragmentation is ╱───────────────│   end    │
          │         ╲    found      ╱                 └──────────┘
          │          ╲─────────────╱
          │                │ Y
          │                ▼
          │     ┌─────────────────────────────┐
          │     │     an ID which is located   │
          │     │   at the begining is acquired │    step23
          │     │    from the multiplexed data  │
          │     └─────────────────────────────┘
          │                │
          │                ▼
          │     ┌─────────────────────────────┐
          │     │  referring to the reference table, │
          │     │   an IP address of  the terminal   │    step24
          │     │   is acquired according to the ID  │
          │     └─────────────────────────────┘
          │                │
          │                ▼
          │     ┌─────────────────────────────┐
          │     │   an IP payload which is located   │
          │     │     at the beginning is acquired   │
          │     │    from the multiplexed data and   │    step25
          │     │ an IP packet which is to be sent to │
          │     │ the destination terminal is prepared│
          │     └─────────────────────────────┘
          │                │
          │                ▼
          │     ┌─────────────────────────────┐
          │     │      the IP packet is sent to       │    step26
          │     │      the destination terminal       │
          │     └─────────────────────────────┘
          │                │
          └────────────────┘
```
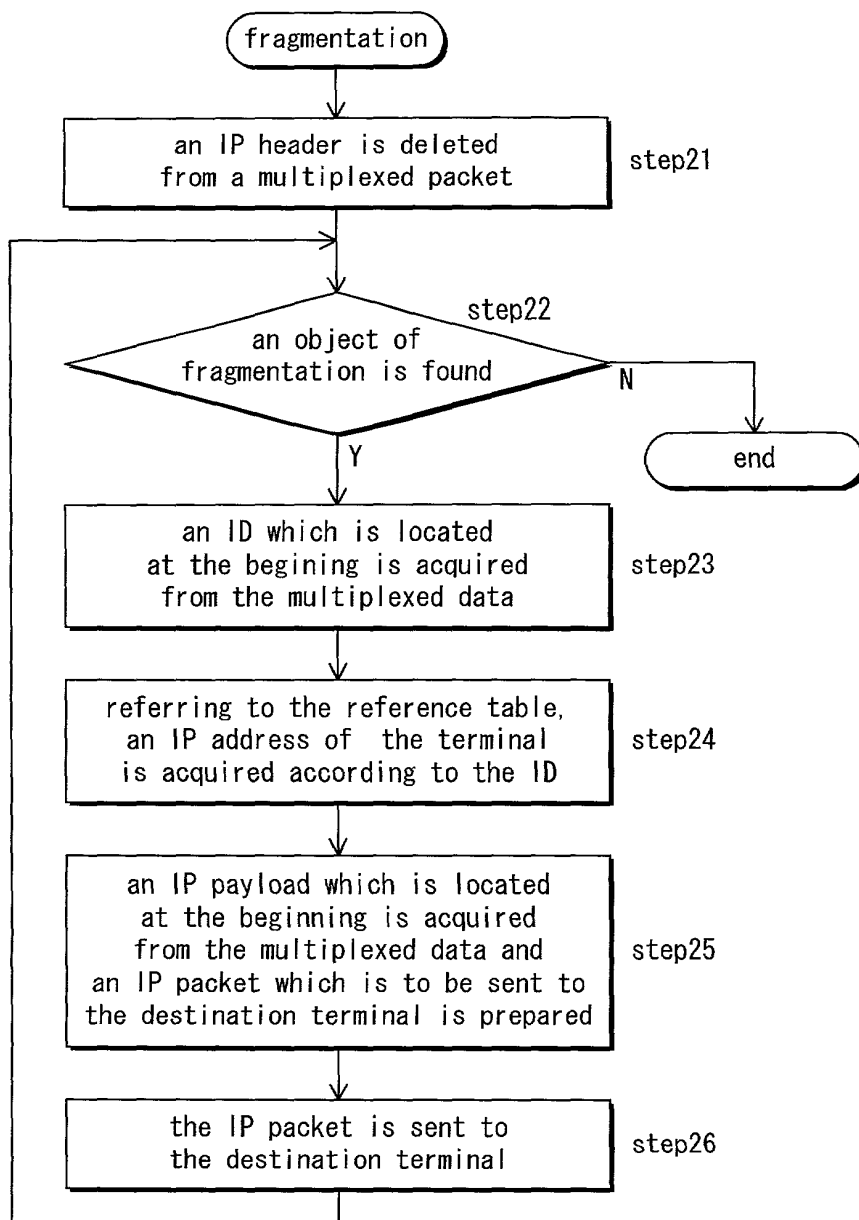
Fig. 7

multiplexed packet

| IP header including
IP address(132.182.1.1)
of destination apparatus | ID
(example:1) | ID
(example:2) | . . . | IP payload
(attached ID1) | IP payload
(attached ID2) | . . . |